

AMENDMENTS TO THE CLAIMS:

Please amend claims 1, 5, 13, 14, 15, 20, 21 and 27 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A structured light generator for illuminating a scene such that light reflected from the scene can be imaged to provide range information, said structured light generator comprising:

a light source arranged to illuminate part of the input face of a light guide,
the light guide comprising a tube having substantially reflective sides; and
projection optics arranged together with said light source and said light guide so as to project ~~an~~ a regular array of distinct ~~image~~spots of the light source towards the scene.

2. (original) A structured light generator as claimed in claim 1 wherein the light guide comprises a tube having a constant cross section.

3. (original) A structured light generator as claimed in claim 2 wherein the cross section of the tube is a regular polygon.

4. (original) A structured light generator as claimed in claim 3 wherein the tube has a square cross section.

5. (currently amended) A structured light generator as claimed in claim 1 wherein the cross sectional area of the light guide is in the range 1 to 50mm² ~~or 2 to 25mm²~~.

6. (previously presented) A structured light generator as claimed in claim 1 wherein the light guide comprises a hollow tube having reflective internal surfaces.

7. (previously presented) A structured light generator as claimed in claim 1 wherein the light guide comprises a tube of solid material adapted such that a substantial amount of light incident at an interface between the material of the tube and surrounding material undergoes total internal reflection.

8. (previously presented) A structured light generator as claimed in claim 1 wherein the light guide is between 10 and 70mm long.

9. (previously presented) A structured light generator as claimed in claim 1 wherein the projection optics comprises a projection lens.

10. (previously presented) A structured light generator as claimed in claim 7 wherein the tube of solid material is shaped at the output face to form the projection lens.

11. (previously presented) A structured light generator as claimed in claim 9 wherein the projection lens is a hemispherical lens.

12. (original) A structured light generator as claimed in claim 11 wherein the centre of the hemispherical lens is located at the centre of the output face of the light guide.

13. (currently amended) A structured light generator as claimed in claim 1 wherein the array of images projected towards the scene have a common point of origin at a centre of an end face of the light guide.

14. (currently amended) A structured light generator as claimed in claim 1 wherein the projection optics are ~~preferably~~ adapted to provide a substantially focussed image at a first distance and a substantially unfocussed image at a second distance, the first and second distance being within the ~~expected~~ range of operation of the apparatus.

15. (currently amended) A structured light generator as claimed in claim 14 wherein the first distance ~~may be~~ is larger than the second distance.

16. (previously presented) A structured light generator as claimed in claim 1 wherein the light source has a non-circular shape.

17. (original) A structured light generator as claimed in claim 16 wherein the light source has a shape which is not symmetric about the axes of reflection of the light guide.

18. (previously presented) A structured light generator as claimed in claim 1 comprising more than one light source, each light source arranged to illuminate part of the input face of the light guide.

19. (original) A structured light generator as claimed in claim 18 wherein the light sources are arranged in a regular pattern.

20. (currently amended) A structured light generator as claimed in claim 18 wherein the light sources are arranged such that different arrangements of sources ~~can be~~are used to provide differing spot densities.

21. (currently amended) A structured light generator as claimed in claim 18 wherein at least one light source emits light at a ~~different wavelength to~~different from the wavelength of another light source.

22. (previously presented) A structured light generator as claimed in claim 18 wherein at least one light source is shaped differently from another light source.

23. (previously presented) A structured light generator as claimed in claim 18 wherein at least one light source has a shape that is not symmetric about a reflection axis of the light guide.

24. (previously presented) A structured light generator as claimed in claim 18 wherein at least one light source is located within the light guide, at a different depth to another light source.

25. (previously presented) A structured light generator as claimed in claim 1 wherein the light source is arranged to run from one side of the input face to another such that the structured light generator illuminates the scene with an array of lines.

26. (original) A structured light generator as claimed in claim 25 wherein the light source is arranged relative to the light guide so as to illuminate the scene with intersecting lines.

27. (currently amended) A structured light generator as claimed in claim 25 wherein the light source ~~may~~ is adapted so as to be capable of illuminate the light guide so as to produce either an array of lines or an array of separate spots.

28. (previously presented) A structured light generator as claimed in claim 1 wherein the light source is arranged to illuminate the input face of the light guide through a mask.

29. (original) A structured light generator as claimed in claim 28 wherein the mask has at least one transmissive portion, the or each transmissive portion being arranged to illuminate only part of the input face of the light guide.

30. (original) A structured light generator as claimed in claim 29 wherein the or at least one of transmissive portions of the mask has a non-circular shape.

31. (original) A structured light generator as claimed in claim 30 wherein the mask has a plurality of transmissive portions and at least some of the transmissive portions have different shapes.

32. (previously presented) A structured light generator as claimed in claim 28 wherein the mask has a plurality of transmissive portions and at least some transmissive portions are transmissive at different wavelengths.

33. (original) A structured light generator as claimed in claim 28 wherein has at least one transmissive portion arranged to run from one side of the input face of the light guide to another such that the structured light generator illuminates the scene with an array of lines.

34. (previously presented) A structured light generator as claimed in claim 28 wherein the mask comprises a modulator adapted such that the transmission characteristics of at least part of the mask may be varied.

35. (previously presented) A structured light generator as claimed in claim 28 further comprising a homogeniser disposed between the light source and the mask.

36. (previously presented) A structured light generator as claimed in claim 1 wherein the generator projects an array of images over an angle of between 50° to 100°.

37. (previously presented) A structured light generator as claimed in claim 1 wherein the generator has a depth of field of 100mm to infinity.